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Global Climate Change: Carbon Reporting Initiative

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Submitted by:
Felipe Casarim and Sandra Brown

Winrock International

Ecosystem Services Unit 2121 Crystal Drive, Suite 500 Arlington, VA 22202

Email: fcasarim@winrock.org





Putting Ideas to Work

1. Background

The main objective of the proposed work is to expand the ability of USAID to report global climate change impacts for forest-based activities by developing and implementing a set of innovative tools with high scientific integrity. Under Year 6 of the cooperative agreement, we will continue to improve the AFOLU carbon calculator (ACC) by updating the data sets, adding in new methods for calculating effectiveness rating, improving the user interface, allowing for different levels of control by administrators, improving the reporting capability across all projects entered into calculator, developing a stand-alone decision tool that can estimate emission reductions or enhancement of removals of carbon over multiple years, and prepare materials for implementing training workshops and training videos. The tool will continue to be simple and easy to use, and will allow the GCC Team and local missions and other stakeholders around the world to increase confidence in the integrity of results.

2. Activities for Year 6

Task 1: Develop a detailed workplan for year 6

Completed in November 2011.

Sub-Task 1a. Data collection for emission factors

Literature reviews have been conducted to identify new spatial and non-spatial datasets that can be used to improve the USAID tool. Several spatial and literature resources were identified that are appropriate for use with the ACC and are described in more detail below.

Carbon Stocks

Mangroves

A literature review has been conducted to identify additional sources of information, both spatial and non-spatial pertaining specifically to improving carbon stock and deforestation/reforestation estimates in mangrove forests. Recently several spatial analysis products became available better detailing the spatial extent and biophysical characteristics of mangroves. Winrock is in the process of obtaining these new spatial datasets, specifically working with USGS staff to obtain relevant data on the area of mangroves and the rates of deforestation and reforestation/afforestation. Winrock is in the process of updating current tabular databases with new literature values to improve upon the mangrove database used in the AFOLU Carbon Calculator (ACC). Scientific literature values of mangrove biophysical characteristics (above-and below-ground biomass, total carbon) are being added to the current database based on a set of peer reviewed papers with meta-analyses of global mangrove data. We expect to have mangrove biomass estimates for all admin units that have areas of mangroves along their coasts

Although we have identified a very useful data base on extent and change in forest cover of mangroves at the USGS, we have had difficulties in actually obtaining it (busy schedule and travel by lead author of the work). However, plans are set to obtain the data by early September when one of Winrock staff will visit the USGS in Sioux Falls to process the data for our needs.

Agroforestry Systems

Significant new information has been published on agroforestry systems over the past few years. As such, carbon accumulation rates in agroforestry systems (AFS) were identified as one of the main gaps within the ACC. Two renowned agroforestry experts have been contracted to help Winrock expand the data base and review and improve the methods used to estimate carbon benefits from AFS implementation.

The work has already commenced and consultants have compiled all types of AFS in various countries present in ACC database based on published literature, and identified improvements in methods used in Agroforestry Tool. Next steps include compiling data on the carbon accumulation rate of the various AFS identified and grouping them into 3-5 easily recognizable classes, and provide more detailed guidance on improvements to agroforestry Tool methods. The ultimate goal of these consultancies is to improve quality of estimates generated by Agroforestry Tool as well as allow users to insert more complete set of data into level B of the Tool.

Selective Logging Timber Extraction Rates

Timber extraction rates through selective logging, whether reduced impact logging (RIL) or conventional logging, is a major data gap. The extraction rate is a key input to the tool and forms the basis of the calculations. Currently the ACC uses an estimate produced by FAO (1990)¹ that has not been updated since. Currently no global database exists that reports average timber extraction rates per country. Winrock has put significant effort into identifying consultants who are experts in tropical forest management and timber harvest rates to undertake this task for various countries and/or regions; however, to date we have had difficulty in contracting consultants to perform the scope of work required (contacted several sources including ITTO)—it seems this is quite a specialized field. Thus far Winrock has only contracted the Tropical Forest Foundation for compiling such data for the country of Indonesia, Winrock is still pursuing marginal routes such as literature review and direct contacts in SE Asia through the Winrock USAID- LEAF project (Malaysia, PNG, Laos, Vietnam).

Secondary Forests

In this quarter Winrock identified many new studies on biomass accumulation in secondary forests in addition to the studies identified in the previous quarter. Overall, the location studies identified were evenly distributed geographically across the tropics representing a range of climate zones and soil types. The majority of the studies were carried-out in secondary forests where the previous use had been shifting agriculture, pasture or cropland.

We extracted information from the studies to develop a database of aboveground biomass in secondary forests in different locations at different times following abandonment of the previous land use. Locations were grouped by main climatic zones (wet, moist, dry) to analyze biomass accumulation as a function of time as well as maximum carrying capacity. The results of the analysis will be integrated into the Forest Restoration/Planation Tool within the ACC to enhance the capability to estimate GHG emission reductions generated by secondary forest growth.

Additional datasets

No change from progress report 2 submitted in April, 2012

Sub-Task 1b. Updating national data sets.

A consultancy has been established with Dr. Sassan Saatchi and work is under way to update the forest carbon stock map. Dr. Saatchi has already updated the remotely sensed database as well as the ground data. See Annex 1 for further details on progress on this work.

Sub-Task 1c. Refining estimates of deforestation rates.

Work is progressing on acquiring the new data on deforestation for the period 2005-2010 with our consultants. It is expected that the data product will be available by the end of August. We then will need to process it to obtain deforestation rates by our administration units. Assuming the final product is completed by August we should have the new product in the ACC by end of September.

¹ FAO. 1993. Forest resources assessment 1990. FAO Forestry Paper 112, pp.59.

Task 2: Build and test tools

Subtask 2a. Modification of the forest management tool

No change from progress report 1 submitted in January, 2012. We are still collecting data as described above under sub Task 1a.

Subtask 2b. Adding capability to add geographic specific details

No change from progress report 2 submitted in April, 2012.

Subtask 2c. Add an effectiveness rating calculation component

Previously we had developed a decision tool providing guidance to ACC users to determine an "effectiveness rating" for forest protection and afforestation/reforestation and agroforestry activities. The effectiveness rating in Level A of the ACC is a measure of the success of project activities in achieving their aims and successfully preventing carbon emissions or ensuring carbon removals from land use and land use change. The decision tool for estimating project effectiveness consist of flowcharts guiding the user to select a score for each factor considered by the tool to calculate an overall effectiveness rating based on the implementation of critical measures to stop deforestation in the case of the forest protection tool, or mitigate threats to plantation survival in the afforestation and agroforestry tool. In this quarter we submitted the tool and a background document to several USAID partners in the AFOLU sector throughout the world for peer review. The tool and background document were revised in response to reviewer comments and reviewer comments and responses were documented. The revised document will be submitted as a separate deliverable. The new method for rating forest protection, forest restoration and agroforestry implementation projects will be transferred to programmers and built into ACC.

Subtask 2d. Policy and capacity building impacts

A document describing potential approaches for estimation of GHG impacts of development funding for policy work and capacity building impacts has been drafted. This document describe the potential approaches for calculating the GHG impacts of policy support and capacity building initiatives, evaluate such approaches and lay out a plan for developing a "Tool for Impact Assessment for Policy-Support and Capacity Building". The document can be seen in its entirety in Annex 2.

Subtask 2e. Develop a new bioenergy and land use tool.

No further progress since Progress Report 1 submitted in January, 2012.

Task 3. Train USAID GCC Team and mission staff (extension of Task 9 of Year 5)

No further progress since Progress Report 2 submitted in April, 2012.

Task 4. Complete outstanding Tasks from Year 5.

No change since Progress Report 1 submitted in January, 2012.

Task 5: Management and implementation

Subtask 5b. Host website.

The current version of the ACC will be continuously hosted by DRG until the end of Year 6 (2012 fiscal year). A new web developer has already been contracted to improve the features and navigability within the ACC as well as host the Calculator for Years 7-8.

Subtask 5c. Production of progress reports.	
This document represents the third of four progress reports to be delivered to USAID during Year 6.	

ANNEX 1

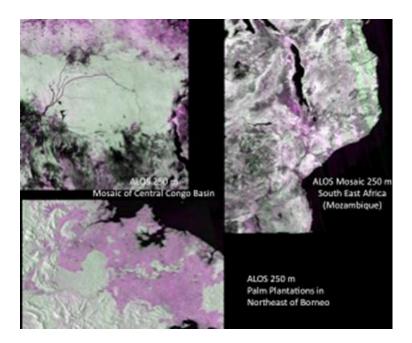
Improvement of Global Tropical Forest Carbon Stock

Sassan Saatchi June 30, 2012

Objectives of the Project: To develop a new map of forest carbon stock in pan-tropical regions at finer resolution, higher accuracy, using the most recent remote sensing and forest inventory data.

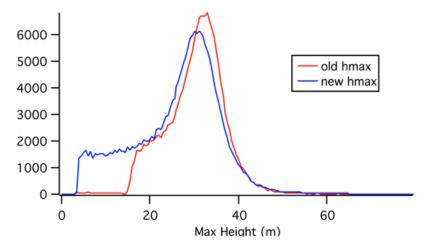
Completion of Task 1: Update the remote sensing and ground data.

1. We have acquired mosaic of ALOS PALSAR data over the entire Africa and southeast Asia for the period of 2008-2009 from Japanese Space Agency (JAXA). Data from South America will be provided to us from our project collaborator Dr. William Salas. The data have been processed by applying a new terrain correction to improve the remaining effect of topography on the data. Images have been resampled to 250 m from 50 m resolution data to improve the effect of the speckle noise. We have also acquired the ALOS mosaic of African continent compiled by the Joint Research Center (JRC, ISPRA, Italy) and have included it in our wall-towall mapping of the African tropical rainforest and woody savanna. The South America data have not been compiled yet. However, we expect to receive the data from William Salas or JAXA directly. The following provide some examples of the compiled data and processed at 250 m resolution in tropics.



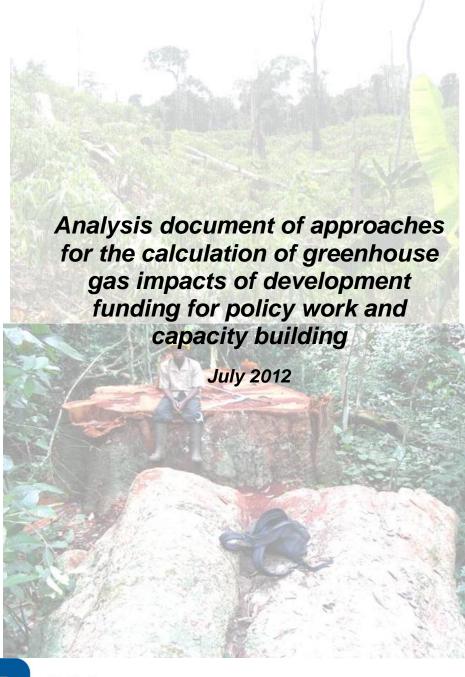
2. We have completed the processing of MODIS 250 m data for the period of 2000, 2005, and 2010. The data have been processed using the cloud mask and includes NDVI, band 1,2, and derived LAI product from NASA algorithm. We have included data from several years to fill the gaps produced by clouds (approximately 3 years around the period year). This will allow us to have a wall-to-wall mosaic of MODIS data to extrapolate the biomass data and have a record of any changes of forest cover that may have occurred with the composite period.

- 3. In addition, we reprocessed the SRTM data to create two layers of surface elevation and ruggedness (standard deviation of elevation) at 250 m spatial resolution.
- 4. The GLAS data has been reprocessed globally to improve the geolocation and creating several attributes to help us to understand the quality of the lidar locations with respect to land cover type and topography. This will allow us filter the data efficiently before including the lidar height metrics in the biomass estimation. In its current version, the data will include both forest maximum height, mean canopy height, and Lorey's height and surface attributes such as slope, elevation, land cover, location, date of acquisition, signal to noise ratio. The figure below shows the comparison of new and old GLAS data over the Amazon basin including areas of savannah. The overall distribution is the same over forested areas. However, new data have been included in areas of secondary forests, and woody savannas.



5. We are currently in the process of improving our field inventory data for the Pan-tropical regions. We have contacted and received agreements from individuals or national institutions from the following countries to include their recent inventory data in the pool: Gabon, Ghana, Cameroon, Mozambique, Uganda, Colombia, Peru, Brazil. We have contacted and waiting for final response from the SilvaCarbon group in Indonesia and Mekong region to receive inventory data. We expect Winrock and other collaborating agencies provide us with any new inventory data to be included in the next run of the model (Winrock has provided details ground data for Guyana and Guinea-Bissau to date).

ANNEX 2





Putting Ideas to Work

1. Background

The main objective of the proposed work is to expand the ability of USAID to report global climate change impacts for forest-based activities by developing and implementing a set of innovative tools with high scientific integrity. During this cooperative agreement we have made progress in developing what is now referred to as the AFOLU Carbon Calculator (Agriculture Forestry and Other Land Uses) that is composed of several tools to estimate the carbon impacts of different types of US AID project activities in the AFOLU sector. However, a significant proportion of development funding is not targeted at implementing specific activities but instead is focused on policy support and capacity building. The current iteration of the tool has no direct way of determining a greenhouse gas impact of such funding. Here we discuss a proposed approach for inclusion of policy-based and capacity building

2. Potential Approaches

Calculation of impact of policy support and capacity building is complex as cause and effect cannot be directly linked.

In the initial proposal and in the work plan for 2012 two potential approaches were proposed with varying responsibility and effort needed from the user:

- Direct tool approach –Compared to historic emissions and normalizing for confounding factors, a greenhouse gas emission reduction could be calculated per \$ or per \$1,000 of investment in policy or capacity building.
- 2. Indirect approach Under the indirect approach the onus would be on the user to derive the impact. So, for example, for a project related to assisting in the development of new forest policy to improve the management and tracking of timber harvesting, the policy might require users to conduct an analysis of impacted concession area and impact on volumes removed per area of concession. The output would be entered into the calculator for management and a greenhouse gas reduction estimate would be returned.

3. Evaluation of Approaches

In the original workplan we aimed to evaluate the potential approaches based on specific case studies of USAID funded projects. However, in discussions with the AOTR for this cooperative agreement it was decided that it would be a poor use of resources to investigate further the *direct tool approach*. The conclusion was reached that variability between specific cases would be so great as to make standard factors for emission reductions per dollar of investment impossible. Thus we focus now exclusively on the *indirect approach*.

4. Plan for Development of a Tool for Impact Assessment for Policy-Support and Capacity Building

The following steps will be taken in development of calculation approaches for activities focused on policy support and capacity building:

- 1. Gather data on current and historic policy-based and capacity building projects and together with the related project staff estimate greenhouse gas impacts;
- 2. Determine tool structure and in particular how many different sets of projects will be needed, i.e., is there a difference between estimating impacts from policy and impacts from capacity

3.	Write accounting procedures detailing steps users must take to collect data, conduct analyses and enter numbers into the USAID AFOLU Calculator in order to create emission estimates.
For mo	ore information or comments:
Winro www.w	e M. Casarim Carbon Specialist, Ecosystem Services ck International 2121 Crystal Drive, Suite 500 Arlington, VA 22202, USA cinrock.org
office / C	03.302.6538 fax 703.302.6512 e-mail fcasarim@winrock.org skype felipe_casarim

building? Is there a difference between different funding areas (e.g. REDD vs. agriculture vs. natural resource management)?

